CLAIMS

1. (Previously Presented) A data communication interface comprising:

a data bus;

a resource internal state memory that stores internal state information for an existing data connection, the internal state information containing data transformation and data link control information developed by a data-handling resource over the course of the existing data connection;

first and second data-handling resources connected to said data bus, to provide data transformation for one or more data connections, each data-handling resource connected to said resource internal state memory such that the internal state information from said first data-handling resource is savable in said resource internal state memory and is retrievable from said resource internal state memory by said second data-handling resource, where the internal state information is savable and retrievable over a bus separate from the data bus; and

a data-handling resource controller that responds to one or more conditions indicating that data from a first data connection should no longer be directed to said first data-handling resource due to failure or removal of said first data-handling resource, by directing said data from said first data connection to said second data-handling resource without loss of said first data connection, where said first data-handling resource ceases to operate upon failure.

2. (Original) The data communication interface of claim 1, wherein said first data-handling resource comprises a first digital signal processor, and said second data-handling resource comprises a second digital signal processor.

3. (Previously Presented) The data communication interface of claim 2, wherein said first and second digital signal processors reside on a common circuit card within said data communication interface.

4. (Original) The data communication interface of claim 3, wherein said data-handling resource controller and said resource internal state memory also reside on said common circuit card.

5. (Previously presented) The data communication interface of claim 2, wherein said first digital signal processor resides on a first circuit card within said interface, and wherein said second digital signal processor resides on a second circuit card within said interface, said second circuit card sharing a common bus with said first circuit card.

6. (Previously presented) The data communication interface of claim 5, wherein said data-handling resource controller resides on a third circuit card within said data communication interface.

7. (Canceled)

8. (Original) The data communication interface of claim 1, wherein said first data-handling resource comprises a first circuit card comprising multiple digital signal processors, and said second data-handling resource comprises a second circuit card comprising multiple digital signal processors.

9. (Previously Presented) The data communication interface of claim 8, wherein said first and second circuit cards each comprise a card internal state memory and save corresponding internal state information from their respective digital signal processors in their respective card internal state memories.

10. (Original) The data communication interface of claim 8, wherein said first data-handling resource can receive multiple simultaneous data connections, and wherein said second data-handling resource can receive a simultaneous transfer of all connections received by said first data-handling resource to said second data-handling resource.

11. (Original) The data communication interface of claim 8, wherein said first data-handling resource can receive multiple simultaneous data connections, and wherein said second data-handling resource can receive a transfer of selected connections received by said first data-handling resource to said second data-handling resource.

12. – 13. (Cancelled)

14. (Previously Presented) A data communication interface comprising:

a data bus;

a resource internal state memory capable of storing internal state information for an existing data connection, the internal state information containing data transformation and data

link control information developed by a data-handling resource over the course of the existing data connection;

N+1 data-handling resources, wherein N > 1, each connected to said data bus, to provide data transformation for one or more data connections, each data-handling resource connected to said resource internal state memory such that the internal state information from the first N of said N+1 data-handling resources is savable in said resource internal state memory and is retrievable from said resource internal state memory by the N+1th said data-handling resource, where the internal state information is savable and retrievable over a bus separate from the data bus; and

a data-handling resource controller that responds to one or more conditions indicating that data from a first data connection should no longer be directed to any one of the first N of said N+1 data-handling resources due to failure or removal of the any one of the first N of said N+1 data-handling resources, by directing said data from said first data connection to said N+1th data-handling resource without loss of said first data connection, where the data-handling resource controller directly monitors the first N of said N+1 data-handling resources to detect the failure or removal.

15. (Previously presented) The data communication interface of claim 14, wherein the N+1th data-handling resource is only assigned data from said first data connection in response to said one or more conditions.

16. (Original) The data communication interface of claim 14, wherein internal state information from each of said N+1 data-handling resources is savable in said resource internal state memory and retrievable by more than one of said N+1 data-handling resources.

17. (Previously presented) The data communication interface of claim 14, wherein each of said N+1 data-handling resources emulates at least one modem.

18. (Previously presented) The data communication interface of claim 14, wherein each of said N+1 data-handling resources emulates at least one voice codec.

19. (Previously Presented) A data communication interface comprising:

a data bus;

a resource internal state memory capable of storing internal state information for an existing data connection, the internal state information containing data transformation and data

link control information developed by a data-handling resource over the course of the existing data connection;

N data-handling resources, wherein N > 1, each connected to said data bus, to provide data transformation for one or more data connections, each data-handling resource connected to said resource internal state memory such that internal state information from each of said N data-handling resources is savable in said resource internal state memory and is retrievable from said resource internal state memory by any other of said N data-handling resources, wherein all N data-handling resources are capable of receiving data simultaneously, where the internal state information is savable and retrievable over a bus separate from the data bus; and

a data-handling resource controller that responds to one or more conditions indicating that data from a first data connection should no longer be directed to one of said N data-handling resources due to failure or removal of the one of the said N data-handling resource, by directing said data from said first data connection to another of said N data-handling resources without loss of said first data connection.

20. (Previously presented) The data communication interface of claim 19, wherein said N data-handling resource controller drops said first data connection when all functional data-handling resources are busy at the time of occurrence of said one or more conditions.

21. (Previously Presented) The data communication interface of claim 19, wherein said data-handling resource controller responds to the one or more conditions indicating that data from the first data connection should no longer be directed to any one of N data-handling resources, by directing said data from said first data connection to any idle data-handling resource.

22. (Previously Presented) A multiple-modem subsystem, said multiple-modem subsystem comprising:

a data bus;

a resource internal state memory capable of storing internal state information for an active modem connection, the internal state information containing data transformation and data link control information developed by a modem resource over the course of the active modem connection;

multiple modem resources, to provide data transformation for one or more active modem connections, each modem resource connected to said data bus and to said resource internal state memory such that internal state information from the modem resources is savable in said resource

internal state memory and is retrievable from said resource internal state memory by other modem resources, where the internal state information is savable and retrievable over a bus separate from the data bus; and

a modem resource controller that responds to failure or removal of any one of said modem resources during an active modem connection by transferring said active modem connection to another modem resource that retrieves the internal state information for the failed one of the modem resources.

23. (Original) The multiple-modem subsystem of claim 22, wherein each of said modem resources comprises a digital signal processor.

24. (Original) The multiple-modem subsystem of claim 22, wherein each of said modem resources comprises a circuit card.

25. – 27. (Canceled)

28. (Previously Presented) A method of operating a data communication interface comprising multiple data-handling resources to provide data transformation for one or more data connections, said method comprising the steps of:

periodically saving internal state information from an active data-handling resource in a location separate from said active data-handling resource, the internal state information containing data transformation and data link control information developed by the active data-handling resource over the course of a data connection, where saving internal state information is performed over a bus separate from the data connection;

directly monitoring said active data-handling resource for one or more conditions requiring removal of a data connection from said active data-handling resource due to failure or removal of said first data-handling resource; and

upon occurrence of a condition requiring removal of the data connection from the active data-handling resource, loading internal state information related to said data connection into a second data-handling resource having excess capacity sufficient to handle the data connection, and transferring the processing of said data connection to said second data-handling resource.

29. (Original) The method of claim 28, wherein said second data-handling resource comprises a redundant resource.

30. (Previously Presented) The method of claim 28, wherein said active data-handling resource can receive multiple simultaneous data connections, and wherein said transferring step comprises transferring the processing of each of the multiple simultaneous data connections to said second data-handling resource.

31. (Previously Presented) The method of claim 28, wherein said active data-handling resource can receive multiple simultaneous data connections, and wherein said transferring step comprises distributing the processing of the multiple simultaneous data connections to multiple data handling resources having excess capacity.

32. (Previously presented) The method of claim 28, further comprising varying the periodical saving of internal state information depending on the data connection load handled by the data communication interface.

33. (Previously presented) The method of claim 28, wherein saving internal state information further comprises saving frame receipt information for frames received.

34. (Previously presented) The method of claim 33, further comprising delaying the sending of a frame acknowledgement signal until frame receipt information has been saved as internal state information.

35. (Previously Presented) The method of claim 28, further comprising saving frames, transmitted over the data connection, in the internal state information at least until the frames are acknowledged.

36. (Currently amended) A data communication interface comprising:

a data bus;

a resource internal state memory that stores internal state information for an existing data connection, the internal state information containing data transformation and data link control information developed by a data-handling resource over the course of the existing data connection;

first and second data-handling resources connected to said data bus, to provide data transformation for one or more data connections, each data-handling resource connected to said resource internal state memory such that the internal state information from said first data-handling

resource is savable in said resource internal state memory and is retrievable from said resource internal state memory by said second data-handling resource, where the internal state information is savable and retrievable over a bus separate from the data bus; and

a data-handling resource controller that responds to one or more conditions indicating that data from a first data connection should no longer be directed to said first data-handling resource due to failure or removal of said first data-handling resource, by directing said data from said first data connection to said second data-handling resource without loss of connection

wherein the resource internal state memory further comprises

a list of received frame acknowledgements,

a list of not received frame acknowledgements, and

records representing frames, each record showing the frame number, the last transmit time if the frame has been transmitted, whether the frame has been acknowledged or not acknowledged, and the data contained in the frame, wherein the data in a frame included in the resource internal state memory includes data about a large on-line stock order.

37. (Canceled)

38. (Currently Amended) The data communication interface of claim 1 wherein the controller is configured to directly monitor the first data-handling resource for failure and to transfer a communication to the second data-handling resource after detecting a failure of the first data-handling resource.

39. (Previously presented) The data communication interface of claim 38 wherein the controller is further configured so that the transfer of a communication to the second data-handling resources occurs independently of communications with the first data-handling resource.

40. (Previously presented) The data communication interface of claim 19 wherein the resource internal state memory further comprises a list of received frame acknowledgements.

41. (Previously presented) The data communication interface of claim 19 wherein the resource internal state memory further comprises a list of not received frame acknowledgements.

42. (Currently Amended) The data communication interface of claim 19 wherein the resource internal state memory further comprises records representing frames, each record showing the

frame number, the last transmit time if the frame has been transmitted, whether the frame has been acknowledged or not acknowledged, and the data contained in the frame, where the data in a frame included in the resource internal state memory includes data associated with a large on-line stock order.

43. – 44. (Canceled)

45. (Currently Amended) A data communication interface comprising:

a resource internal state memory that stores internal state information for an existing data connection, the resource internal state memory including a list of received frame acknowledgements, a list of not received frame acknowledgements, records representing frames, each record showing the frame number, the last transmit time if the frame has been transmitted, whether the frame has been acknowledged or not acknowledged, and the data contained in the frame, where the data in a frame included in the resource internal state memory includes data associated with a large on-line stock order;

first and second data-handling resources connected to a data bus, to provide data transformation for one or more data connections, each data-handling resource connected to said resource internal state memory such that the internal state information from said first data-handling resource is savable in said resource internal state memory and is retrievable from said resource internal state memory by said second data-handling resource; and

a data-handling resource controller that responds to one or more conditions indicating that data from a first data connection should no longer be directed to said first data-handling resource, by directing said data from said first data connection to said second data-handling resource without loss of said first data connection.

46. (Previously presented) The data communication interface of claim 45, where the data-handling resource controller directs said data from said first data connection responsive to the failure or removal of said first data-handling resource.

47. (Previously presented) The data communications interface of claim 46, where said first data-handling resource ceases to operate upon failure.

48. (Previously presented) The data communication interface of claim 46, where the data-handling resource controller directly monitors said first data-handling resource to detect the failure or removal.

49. - 52. (Canceled)